

# Diffusion Probabilistic Modeling for Video Generation

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## Abstract

Denoising diffusion probabilistic models are a promising new class of generative models that mark a milestone in high-quality image generation. This paper showcases their ability to sequentially generate video, surpassing prior methods in perceptual and probabilistic forecasting metrics. We propose an autoregressive, end-to-end optimized video diffusion model inspired by recent advances in neural video compression. The model successively generates future frames by correcting a deterministic next-frame prediction using a stochastic residual generated by an inverse diffusion process. We compare this approach against six baselines on four datasets involving natural and simulation-based videos. We find significant improvements in terms of perceptual quality and probabilistic frame forecasting ability for all datasets.